

Please amend the present application as follows:

Claims

The following is a copy of Applicant's claims that identifies language being added with underlining ("___") and language being deleted with strikethrough ("—"), or double brackets ("[[]]"), as is applicable:

1-39. (Canceled)

40. (Previously presented) An ink jet printhead comprising:

a substrate;

an ink feed slot formed through the substrate;

a thin film layer disposed on a surface of the substrate, the thin film layer defining a plurality of firing resistors, a plurality of ink feed openings formed through the thin film layer to provide respective ink paths through the thin film layer from the ink feed slot;

a barrier/orifice structure disposed on the thin film layer, the structure defining an array of nozzles arranged in a plurality of nozzle columns and an array of firing chambers in correspondence with the array of nozzles;

the firing resistors being arranged in correspondence with the firing chambers;

the barrier/orifice structure further comprising a continuous rib portion extending between adjacent first and second ones of the plurality of nozzle columns and over said ink feed slot to fluidically separate the first and second ones of the nozzle columns;

wherein said plurality of ink feed openings are arranged in a first group on a first side of said rib portion for feeding nozzles of the first one of said plurality of

columns, and a second group on a second side of said rib portion for feeding nozzles of the second one of said plurality of columns; and

wherein the nozzles comprising the array are arranged in subgroups of nozzles, each subgroup comprising at least two nozzles, each subgroup fed with liquid ink through a corresponding ink flow path isolated from other nozzles of the array by the barrier layer/orifice structure, wherein the ink flow path for each nozzle subgroup includes an opening or set of openings through the thin film layer and through the substrate, and wherein each nozzle of a nozzle subgroup supplied with ink via said opening or set of openings.

41. (Previously presented) An ink jet printhead comprising:

a substrate;

an ink feed slot formed through the substrate;

a thin film layer disposed on a surface of the substrate, the thin film layer defining a plurality of firing resistors, a plurality of ink feed openings formed through the thin film layer to provide respective ink paths through the thin film layer from the ink feed slot;

a barrier/orifice structure disposed on the thin film layer, the structure defining an array of nozzles arranged in a plurality of nozzle columns and an array of firing chambers in correspondence with correspondence with the array of nozzles;

the firing resistors being arranged in correspondence with the firing chambers;

the barrier/orifice structure further comprising a continuous rib portion extending between adjacent first and second ones of the plurality of nozzle columns to fluidically separate the first and second ones of the nozzle columns, said continuous rib portion extending over said ink feed slot;

wherein said plurality of ink feed openings are arranged in a first group on a first side of said rib portion for feeding nozzles of the first one of said plurality of columns, and a second group on a second side of said rib portion for feeding nozzles of the second one of said plurality of columns; and

wherein the nozzles comprising each column of the array are arranged in subgroups of nozzles, each subgroup comprising at least two nozzles, each subgroup fed with liquid ink through a corresponding ink flow path isolated from other nozzles of the array by the barrier layer/orifice structure, further comprising printhead electronics that provide firing pulses to the drop generators such that no two nozzles of each nozzle subgroup are fired sequentially.

42. (Original) The printhead of Claim 41, wherein the printhead electronics provides said firing pulses such that no two nozzles in a nozzle subgroup are activated simultaneously.

43. (Previously Presented) The printhead of Claim 41 wherein the barrier/orifice structure includes a polymer layer.

44. (Previously Presented) The printhead of Claim 41 wherein the nozzles of each nozzle column have a pitch of 600 nozzles per inch (npi).

45. (Canceled)

46. (Currently amended) A fluid ejecting printhead, comprising:

a substrate having a surface, and a fluid supply slot formed through the substrate to the surface;

a columnar group of drop generators formed on the surface that are arranged into subgroups each comprising at least two drop generators, each of said subgroups supplied with fluid through a plurality of fluid feed holes connected to the fluid supply slot to provide fluid to each of the subgroups of drop generators, each subgroup being fluidically isolated from other subgroups on the surface, the columnar group of drop generators arranged in a column transverse to a direction of relative movement between the printhead and a print medium; and

printhead electronics that provide firing pulses to the drop generators such that no two drop generators in the same subgroup are activated in sequence.

47. (Previously Presented) The printhead of Claim 46, wherein the printhead electronics activates the drop generators in said columnar group of drop generators one at a time.

48. (Previously Presented) The printhead of Claim 47, wherein the columnar group of drop generators is a primitive, and the substrate comprises a plurality of primitives arranged in a column.

49. (Previously Presented) The printhead of Claim 46, wherein each subgroup includes a chamber and at least two firing resistors.

50. (Canceled)

51. (Currently amended) The printhead of Claim 46, wherein the substrate includes a thin film layer that overlays the fluid feed slot, the thin film layer ~~having~~ openings defining the fluid feed holes that couple each of the subgroups to the fluid feed slot.

52. (Previously Presented) The printhead of Claim 46, further including a fluid supply fluidically coupled to the fluid feed slot to supply the feed slot with fluid.

53. (Previously Presented) The printhead of Claim 52, wherein the fluid supply is a supply of liquid ink.

54. (Previously Presented) The printhead of Claim 51, wherein the thin film layer comprises a plurality of thin films, the thin film layer forming heater resistors in each of the drop generators.

55. (Previously Presented) The printhead of Claim 46, wherein the subgroups include a pair of drop generators.

56. (Currently amended) A system for delivering fluid, comprising:
a printhead substrate having a surface on which is formed a columnar group of drop generators that are arranged into subgroups, each of the subgroups including more than one drop generator~~[[,]]~~ and a plurality of fluid feed holes connected to one or more fluid feed slots formed through the substrate to provide fluid to each of the subgroups of drop generators in the columnar group, the subgroups being fluidically

isolated from each other on the surface, the columnar group of drop generators arranged in a column transverse to a direction of relative movement between the printhead and a print medium;

a printhead control electronics electrically coupled to the printhead, the printhead control electronics providing firing signals to the printhead such that no two drop generators in the same subgroup are activated in sequence.

57. (Previously presented) The system of Claim 56, further comprising an apparatus for imparting relative motion between the printhead substrate and the print media.

58. (Previously Presented) The system of Claim 56, further comprising a fluid source commonly coupled to all of the drop generators in a columnar group through the one or more fluid feed slots.

59. (Previously Presented) The printhead of Claim 56, further including a fluid supply fluidically coupled to the fluid feed slot to supply the feed slot with fluid.

60. (Previously Presented) The printhead of Claim 59, wherein the fluid supply is a supply of liquid ink.

61. (Previously Presented) The system of Claim 56, wherein the subgroups include a pair of drop generators.

62. (Currently amended) The system of Claim 56, wherein the ~~substrate includes a thin film layer having a plurality of fluid feed holes are formed therein in a thin film layer communication with the one or more of the fluid feed slots to provide fluid to each of the subgroups of drop generators.~~

63. (Previously Presented) The printhead of Claim 56, wherein the printhead electronics activates the drop generators in said columnar group of drop generators one at a time.

64. (Previously Presented) The printhead of Claim 63, wherein the columnar group of drop generators is a primitive, and the substrate comprises a plurality of primitives arranged in a column.

65. (Currently amended) A method of controlling a printhead, comprising:
providing a printhead having a substrate surface with a columnar group of drop generators formed on the surface that are arranged into subgroups each comprising more than one drop generator, the columnar group of drop generators arranged in a column transverse to a direction of relative movement between the printhead and a print medium;

fluidically isolating each subgroup from other subgroups on the surface;

feeding each of the subgroups with fluid through a plurality of fluid feed holes connected to a fluid supply slot formed through the substrate that provide fluid to each of the subgroups of drop generators; and

providing electrical signals to the printhead to activate the drop generators to eject fluid drops such that no two drop generators in the same subgroup are activated in sequence.

66. (Previously Presented) The method of Claim 65, further comprising:
providing fluid to the subgroups from a common fluid source through the slot.

67. (Previously Presented) The method of Claim 66, further comprising
replacing fluid to the fluid source.

68. (Previously Presented) The method of Claim 67 wherein the fluid is
liquid ink.

69. (Canceled)

70. (Currently amended) The method of Claim 67, ~~further comprising~~
~~providing ink~~ wherein feeding fluid to each subgroup comprises providing fluid
through ~~multiple openings~~ fluid feed holes formed in a thin film layer.

71. (Canceled)

72. (Previously Presented) The method of Claim 65, wherein said
providing electrical signals to the printhead further activates the drop generators such
that no two drop generators in the same subgroup are activated simultaneously.

73. (Currently amended) An ink jet printhead comprising:

- a substrate;
- a thin film structure formed on the substrate and defining printhead circuitry;
- a barrier/orifice structure supported by the substrate and defining an array of nozzles arranged in a plurality of nozzle columns and an array of firing chambers in correspondence with the array of nozzles, the nozzle columns arranged transverse to a direction of relative movement between the printhead and a print medium;

the nozzles comprising each column of the array arranged in subgroups of nozzles, each subgroup comprising at least two nozzles, each subgroup fed with liquid ink through a corresponding ink flow path isolated from other nozzles of the array by the barrier layer/orifice structure, wherein the ink flow path for each nozzle subgroup includes ~~an opening or set of openings through~~ a plurality of fluid feed holes formed in the substrate, and wherein each nozzle of a nozzle subgroup is supplied with ink via ~~said opening or set of openings~~ plurality of fluid feed holes.

74. (Previously Presented) The printhead of Claim 73, further comprising printhead electronics that provide firing pulses to the drop generators such that no two nozzles of each nozzle subgroup are fired in sequence.

75. (Previously Presented) The printhead of Claim 74, wherein the printhead electronics provides said firing pulses such that no two nozzles in a nozzle subgroup are activated simultaneously.

76. (Previously Presented) The printhead of Claim 73 wherein the barrier/orifice structure includes a polymer layer.

77. (Previously Presented) The printhead of Claim 73 wherein the nozzles of each nozzle column have a pitch of 600 nozzles per inch (npi).

78. (Previously presented) An ink jet printhead comprising:

a substrate having an ink feed slot formed therein;

a thin film layer disposed on a surface of the substrate, the thin film layer defining a plurality of firing resistors, the thin film layer having a plurality of ink feed openings formed through to provide respective ink paths through the ink feed slot and thin film layer;

a barrier/orifice structure disposed on the thin film layer, the structure defining an array of nozzles arranged in a plurality of nozzle columns and an array of firing chambers in correspondence with the array of nozzles, the nozzles comprising each of said plurality of nozzle columns of the array are arranged in subgroups of nozzles, each subgroup comprising at least two nozzles, each subgroup fed with liquid ink through a corresponding ink flow path isolated from other nozzles of the array by the barrier layer/orifice structure;

the firing resistors being arranged in correspondence with the firing chambers;

the barrier/orifice structure further comprising a continuous rib portion extending between adjacent first and second ones of the plurality of nozzle columns and over said ink feed slot to fluidically separate the first and second ones of the nozzle columns.

79. (Previously Presented) The printhead of Claim 78 wherein said plurality of ink feed openings are arranged in a first group on a first side of said rib portion for feeding nozzles of the first one of said plurality of columns, and a second group on a second side of said rib portion for feeding nozzles of the second one of said plurality of columns.

80. (Canceled)

81. (Previously presented) The printhead of Claim 40, wherein said ink feed slot is an elongated trench extending along a length of said nozzle columns.

82. (Previously presented) The printhead of Claim 41, wherein said ink feed slot is an elongated trench extending along a length of said nozzle columns.

83. (Previously presented) The printhead of Claim 78, wherein said ink feed slot is an elongated trench extending along a length of said nozzle columns.